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2627	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/684,461	**Applicant(s)** IKENAKA, KIYONO
	Examiner Christopher R. Lamb	**Art Unit** 2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _18 September 2006_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-83_ is/are pending in the application.

4a) Of the above claim(s) _See Continuation Sheet_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6,10,11,14,17,23-28,32,33,36,54,60-62,65-67,70 and 71_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 7-9,12,13,15,16,18-22,29-31,34,35,37-53,55-59,63,64,68,69 and 72-83.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species V, sub-species B, and sub-sub species B-i in the reply filed on September 18th, 2006 is acknowledged.

2. Claims 7-9, 12, 13, 15, 16, 18-22, 29-31, 34, 35, 37-53, 55-59, 63, 64, 68, 69, and 72-83 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on September 18th, 2006.

Regarding claims 12, 19-22, 34, 46, 50, 56-59, 68, and 69:

Applicant, in the reply filed on September 18th, 2006, indicated that these claims read on the elected species. However, the Examiner has determined that they do not for the reasons given below.

Regarding claim 12:

It is dependent on claim 7, which does not read on the elected species, because it requires that light of the second wavelength enter the objective lens as a diverging ray.

Regarding claims 19-22:

They are dependent on claim 18, which does not read on the elected species because it requires that n1A:n1D=n2A:n2D.

Regarding claim 34:

It is dependent on claim 29, which is similar to claim 7, and does not read on the elected species.

Regarding claims 46 and 50:

The elected species (sub-species B) has a second diffractive region on the optical element. It is the Examiner's understanding that this second diffractive region takes the place of a separate aperture limiting element: thus these claims do not read on the elected species.

Regarding claims 56-59:

These claims are dependent on claim 55, which does not read on the elected invention because it requires that n1A:n1D = n2A:n2D.

Regarding claims 68 and 69:

These claims are directed toward a second beam shaper for the wavelength λ2. There is no second beam shaper in the species of Fig. 6, only one beam shaper in common for λ1 and λ2.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

6. Claim 17 is objected to because of the following informalities: in line 3, "λ" should probably be "λ1." Appropriate correction is required.

7. Claim 61 is objected to because of the following informalities: in line 3, "an optical of" should be "an optical path of." Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3, 10, 11, 14, 23-25, 32, 33, 36, 60, 61, and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Shiono et al. (US 6,834,036).

Regarding claim 1:

Shiono discloses:

An optical element for use in an optical pickup apparatus which comprises

a first light source having a wavelength λ1 (column 25, line 55 to column 26, line 10),

a second light source having a wavelength λ2 (λ1<λ2) (column 25, line 55 to column 26, line 10: Shiono's λ3 is equivalent to the claimed λ2), a third light source having a wavelength $\lambda3$ ($1.6\cdot\lambda1 \le \lambda3 \le 2.0\cdot\lambda1$ and $\lambda2 < \lambda3$) (column 25, line 55 to column 26, line 10: Shiono's $\lambda2$ is equivalent to the claimed $\lambda3$), and

a light converging system including an optical element (column 25, lines 35-55),

wherein the light converging system converges a light flux from the first light source onto an information recording plane of a first optical information recording medium through a protective layer having a thickness $t1$ so that recording and/or reproducing information is conducted for the first optical information recording medium (this corresponds to the high-density disk of column 25, lines 55-65),

converges a light flux from the second light source onto an information recording plane of a second optical information recording medium through a protective layer having a thickness $t2$ ($0.8\cdot t1 \le t2 \le 1.2\cdot t1$) so that recording and/or reproducing information is conducted for the second optical information recording medium (this corresponds to the DVD disk of column 26, lines 1-10), and

converges a light flux from the third light source onto an information recording plane of a third optical information recording medium through a protective layer having a thickness $t3$ ($1.9\cdot t1 \le t3 \le 2.1\cdot t1$) so that recording and/or reproducing information is conducted for the third optical information recording medium (this corresponds to the CD disk of column 26, lines 5-15),

the optical element comprising:

a first diffractive structure on at least one surface thereof (column 25, lines 35-55), wherein when recording and/or reproducing is conducted for the first, second and third information recording mediums respectively, a light flux emitted from each of the first, second and third light sources passes in common through the first diffractive structure and thereafter is converged respectively to form a light spot on an information recording plane of the first, second and third optical information recording mediums (column 25, lines 35-55), and

wherein in a case that a light flux having a wavelength λ1 or λ3 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the first diffractive structure is n1 in the light flux having the wavelength λ1 and n3 in the light flux having the wavelength λ3 (n1 and n3 are a natural number respectively), the following formula is satisfied: $1.1 \geq (n1 x \lambda 1)/(n3 x \lambda 3) \geq 0.9$ (column 25, line 30 to column 26, line 10: the wavelength λ1 is approximately 400nm and n1 is fourth-order light; the wavelength λ3 (λ2 of Shiono) is approximately 800 nm and n3 is second-order light; 400x4/800x2=1).

Regarding claim 2:

In Shiono the order numbers n1 and n3 satisfy the following formula:

n1 : n3 = 2 : 1

(n1 is 4; n3 is 2: the ratio of 4 to 2 is equivalent to the ratio of 2 to 1).

Regarding claim 3:

Shiono discloses wherein when the optical system magnification of the optical element for the wavelength λ1 is m1, the following formula is satisfied: m1 = 0 (all this means is that the beam enters the optical element as parallel rays: this is apparent in Shiono Fig. 8).

Regarding claim 10:

In Shiono, in a case that a light flux having a wavelength λ2 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the diffractive structure is n2 in the light flux having the wavelength λ2 (n2 is a natural number), the following formula is satisfied: $(n1x\lambda1)/(n2x\lambda2)\leq1$ (in Shiono, $n1x\lambda1=4x400nm=1600nm$; $n2x\lambda2=3x600nm=1800nm$; $1600/1800\leq1$).

Regarding claim 11:

In Shiono, wherein when the optical system magnification of the optical element for the wavelength λ2 is m2, the following formula is satisfied: $m2=0$ (this is similar to claim 3: in Shiono Fig. 8 the rays for λ2 enter the optical element as parallel rays, and thus satisfy the equation).

Regarding claim 14:

In Shiono the optical element is an objective lens (Fig. 8).

Regarding claims 23-25, 32, 33, and 36:

All elements positively recited in the claims have already been identified with regards to earlier claims. No further elaboration is necessary.

Regarding claim 60:

In Shiono the third light source is a hololaser (the photodetectors and laser are integrated as per Fig. 8).

Regarding claim 61:

In Shiono a first chromatic correcting element to achromatize a light flux having a wavelength λ1 is located on an optical path of the light flux having the wavelength λ1 (Fig. 8: the first chromatic correcting element is the objective lens).

Regarding claim 65:

In Shiono a collimator is located on an optical path on which the light flux having the wavelength λ1 and the light flux having the wavelength λ2 pass in common (Fig. 8).

10. Claims 1-6, 10, 14, 17, 23-28, 32, 36, and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Kimura et al. (US 2003/0185134).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1:

An optical element for use in an optical pickup apparatus which comprises

a first light source having a wavelength λ1 (paragraphs 365-366),

a second light source having a wavelength λ2 (λ1<λ2) (paragraphs 365-366),

a third light source having a wavelength λ3 ($1.6 \cdot \lambda 1 \le \lambda 3 \le 2.0 \cdot \lambda 1$ and $\lambda 2 < \lambda 3$) (paragraphs 365-366), and

a light converging system including an optical element (paragraphs 367-368), wherein the light converging system converges a light flux from the first light source onto an information recording plane of a first optical information recording medium through a protective layer having a thickness t1 so that recording and/or reproducing information is conducted for the first optical information recording medium (paragraphs 364, 367),

converges a light flux from the second light source onto an information recording plane of a second optical information recording medium through a protective layer having a thickness t2 ($0.8 \cdot t1 \leq t2 \leq 1.2 \cdot t1$) so that recording and/or reproducing information is conducted for the second optical information recording medium (paragraphs 364, 368), and

converges a light flux from the third light source onto an information recording plane of a third optical information recording medium through a protective layer having a thickness t3 ($1.9 \cdot t1 \leq t3 \leq 2.1 \cdot t1$) so that recording and/or reproducing information is conducted for the third optical information recording medium (paragraphs 364, 368),

the optical element comprising:

a first diffractive structure on at least one surface thereof (paragraph 360),

wherein when recording and/or reproducing is conducted for the first, second and third information recording mediums respectively, a light flux emitted from each of the first, second and third light sources passes in common through the first diffractive structure and thereafter is converged respectively to form a light spot on an information recording plane of the first, second and third optical information recording mediums (Fig. 2, and wherein in a case that a light flux having a wavelength λ1 or λ3 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the first diffractive structure is n1 in the light flux having the wavelength λ1 and n3 in the light flux having the wavelength λ3 (n1 and n3 are a natural number respectively), the following formula is satisfied: $1.1 \geq (n1 \times \lambda 1)/(n3 \times \lambda 3) \geq 0.9$ (paragraph 370: n1=2 and n3=1, meeting the formula).

Regarding claim 2:

In Kimura the order numbers n1 and n3 are 2 and 1, respectively.

Regarding claim 3:

In Kimura the optical system magnification of the optical element for the wavelength λ1 is 0 (paragraph 367).

Regarding claims 4 and 5:

Kimura discloses that m3 falls within the range of –0.25 to –0.05 (paragraph 38). The value of 0.075, for example, falls within this range and also within the ranges of claims 4 and 5.

Regarding claim 6:

In Kimura, wherein in a case that a light flux having a wavelength λ2 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the diffractive structure is n2 in the light flux having the wavelength λ2 (n2 is a natural number), the following formula is satisfied: $(n2 \times \lambda 2)/(n3 \times \lambda 3) \leq 1$ (paragraph 370: n2=1 and n3=1, which meets this formula).

Regarding claim 10:

In Kimura, wherein in a case that a light flux having a wavelength λ2 comes into the optical element, when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays generated by the diffractive structure is n2 in the light flux having the wavelength λ2 (n2 is a natural number), the following formula is satisfied: $(n1 \times \lambda 1)/(n2 \times \lambda 2) \leq 1$ (paragraph 370: n1=2 and n2=1, so the formula is met).

Regarding claim 14:

In Kimura the optical element is an objective lens (paragraph 359).

Regarding claim 17:

In Kimura, at least one optical surface of the optical element comprises a first region to allow a light flux having any one of wavelength λ1, λ2 and λ3 emitted respectively from the first, second and third light sources to pass through so as to conduct recording and/or reproducing for the first, second and third optical information recording mediums respectively (paragraph 369, Fig. 1: region NA3), and

a second region to allow a light flux having one of wavelength λ1 and λ2 emitted respectively from the first and second light sources to pass through so as to conduct recording and/or reproducing for the first and second optical information recording mediums respectively and not to allow a light flux having a wavelength λ3 emitted from the third light source to pass through (paragraph 369, Fig. 1: region NA3-NA2; also paragraph 388),

wherein the first diffractive structure is provided on the first region and a second diffractive structure is provided on the second region (paragraph 369), wherein when an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ1 generated by the first diffractive structure is n1A, an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ2 generated by the first diffractive structure is n1D, an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ1 generated by the second diffractive structure is n2A, and an order number of a diffracted ray having the maximum diffraction efficiency among diffracted rays having the wavelength λ2 generated by the second diffractive structure is n2D, the following formula is satisfied: n1A:n1D≠n2A:n2D (this formula simply states that the ratio of the diffraction orders for the first and second wavelengths are different between regions. Kimura, paragraph 391, states that different order lights may be used in each area: based upon the possible diffraction order examples given by Kimura, if a different order light is used between regions, the ratio will also be different).

Regarding claims 23-28, 32, 36, and 54:

These claims are similar to earlier claims and are similarly rejected.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 62, 66, 67, 70, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiono.

Regarding claim 62:

Shiono discloses an optical pickup apparatus as discussed above.

Shiono doesn't disclose (in the embodiment relied upon) wherein a second chromatic correcting element to achromatize a light flux having a wavelength λ2 is located on an optical path of the light flux having the wavelength λ2.

However, Shiono does disclose in another embodiment (Fig. 1) that there may be a separate chromatic correcting element for each wavelength on its optical path. Shiono in fact discloses numerous variations on the number and placement of chromatic correcting elements (Fig. 1 to Fig. 8).

It would have been obvious to one of ordinary skill in the art to include in Shiono wherein a second chromatic correcting element to achromatize a light flux having a wavelength λ2 is located on an optical path of the light flux having the wavelength λ2, because a first and second chromatic correcting element are used in the same environment, for the same purpose, and achieve the same result as a single chromatic correcting element, as taught by Shiono. Furthermore, one of ordinary skill in the art would have expected the Applicant's invention to perform equally well with a single chromatic correcting element (as Applicant themselves discloses).

Regarding claim 66:

Shiono discloses an optical pickup apparatus as discussed above.

Shiono does not disclose wherein a first beam shaper to shape a light flux having the wavelength λ1 is located at a light source side than the collimator on an optical path on which the light flux having the wavelength λ1 passes.

However, Shiono does disclose an embodiment in which a first beam shaper (Fig. 7: 19) and a collimator (Fig. 7: 3) are separate elements. In this embodiment, the beam shaper is on the other side of the collimator than the claim.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the beam shaper on the light source side of the collimator, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse,* 86 USPQ 70.

Regarding claim 67:

In Shiono the first beam shaper corrects chromatic aberration for a light flux having the wavelength λ1.

Regarding claim 70:

The rejection over Shiono as applied to claim 66 also applies to this claim.

Regarding claim 71:

Shiono does not specifically disclose "wherein the collimator is made of a plastic material." Shiono does not disclose what the collimator is made from.

It would have been obvious to one of ordinary skill in the art to include in Shiono wherein the collimator is made of a plastic material, because the Examiner takes Official Notice that lens made from plastic materials are well known in the art.

The motivation would have been to, for example, use a lighter material than glass.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Lamb whose telephone number is (572) 272-5264. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CRL 11/17/06

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